CLAIMS

What is claimed is:

1. A composition for wetting a surface of a material having a dielectric layer during a chemical mechanical process (CMP) after the material has been exposed to a slurry, the composition comprising:

a non-ionic surfactant having an HLB value in the range from 1 to 15, in an amount of between about .005-10% weight of the composition.

2. The composition of claim 1, wherein the surfactant when dissolved in a liquid has a contact angle when the fluid contacts the surface of the material having a dielectric layer and wherein the contact angle is in the range of 0 to 40 degrees.

3. The composition of claim 2, wherein the contact angle is in the range of 10 to 30 degrees.

4. The composition of claim 1, wherein the HLB value is in the range from 7-10.

5. The composition of claim 1, wherein the surfactant comprises a polymer comprising at least one selected from the group ethylene oxide, propylene oxide, or a block copolymer of ethylene oxide and propylene oxide.

6. The composition of claim 1, wherein the surfactant comprises at least one selected from the group comprising Pluronic® or Tetronic®.

7. The composition of claim 1, further comprising a complexing agent capable of complexing with trace metal impurities and Cu residue left by the slurry.

8. The composition of claim 7, wherein the complexing agent is selected from the group comprising organic amines and organic acids.

9. The composition of claim 8, wherein the complexing agent has standard reduction potential values of between about 0.1-0.6 volts for a Cu complexation reaction.

10. The composition of claim 9, wherein the complexing agent is selected from the group comprising ethylenediaminetetraacetic acid (EDTA), triethylenetetraamine (TETA), diethylenetriamine (DETA), and nitrilotricetic acid (NTA).

11. The composition of claim 7, further comprising:
a reducing agent.

12. The composition of claim 11, wherein the reducing agent is selected from the group comprising ascorbic acid, glycolic acid, glyoxal, sugars, alcohols, polyhydroxy acids, and polyhydroxy aldehydes.

13. The composition of claim 9, further comprising a corrosion inhibitor.

14. The composition of claim 13, wherein the corrosion inhibitor is selected from the group comprising benzotriazole (BTA), 1,2,4-triazole, imidazole, and derivatives thereof, gallic acid, catechol, and resorcinol.

15. The composition of claim 11, further comprising a pH adjuster.

16. The composition of claim 15, wherein the pH adjuster is selected from the group comprising an organic or inorganic acid having an ionic strength in the range of 10^{-2} – 10^{-5} mol/dm^3.

17. The composition of claim 13, wherein the composition has an ionic strength that is between about $\pm$ 10^{-2} mol/dm^3 of an ionic strength of the slurry.

18. A composition for wetting a surface of a material having a dielectric constant during a chemical mechanical process (CMP) after the material has been exposed to a slurry, the composition comprising:

a non-ionic surfactant in an amount of between about .005-10% weight of the composition, wherein the surfactant has an HLB value in the range from 1 to 15;

a complexing agent capable of complexing with trace metal impurities and Cu residue left by the slurry;

a corrosion inhibitor; and

a pH adjuster.

19. The composition of claim 18, wherein the composition has an ionic strength that is between about $\pm 10^{-2}$ mol/dm^3 of an ionic strength of the slurry.

20. A composition for wetting particles on a wafer after a chemical-mechanical polishing process, wherein the wafer has been exposed to a slurry having a pH, the solution comprising:

a corrosion inhibiting agent; and

a pH adjuster,

wherein the composition has a pH that is ±1 pH unit of the pH of the slurry and an ionic strength of between about 10^{-2} and 10^{-5} mol/dm^3.

21. The composition of Claim 20, wherein the pH adjuster is an acid.

22. The composition of Claim 21, wherein the acid is an organic acid.

23. The composition of Claim 22, wherein the organic acid is selected from the group comprising: a monocarboxylic acid, dicarboxylic acid, tricarboxylic acid.

24. The composition of Claim 23, wherein the monocarboxylic acid is selected from the group comprising ethanoic acid, propanoic acid, and butanoic acid.

25. The composition of Claim 23, wherein the dicarboxylic acid is selected from the group comprising malonic acid, oxalic acid, succinic acid, glutamic acid, and adipic acid.

26. The composition of Claim 23, wherein the tricarboxylic acid is citric acid.

27. The composition of Claim 20, wherein the pH adjuster is a base.

28. The composition of Claim 27, wherein the base is selected from the group comprising sodium hydroxide, potassium hydroxide, or ammonium hydroxide, and tetraalkylammounium hydroxide, and mixtures thereof.

29. The composition of Claim 20, wherein the corrosion inhibiting agent has an aromatic structure.

30. The composition of Claim 20, wherein the corrosion inhibiting agent has an aliphatic structure.

31. The composition of Claim 20, wherein the corrosion inhibiting agent has a heterocyclic structure.

32. The composition of Claim 20, wherein the corrosion inhibitor is selected from the group comprising benzotriazole, pyrogallol, catechol, resorcinol, gallic acid, 1,2,4-triazole, imidazole and derivatives thereof, and quinaldic acid.

33. The composition of Claim 20, further comprising a surfactant.

34. The composition of Claim 33, wherein the surfactant is selected from the group comprising non-ionic surfactants, such as, polyethylene oxide, polypropylene oxide, or block-copolymers of polyethylene oxide and polypropylene oxide, anionic surfactants, such as, sodium or potassium salts of straight chain fatty acids, alkylbenzene sulfonates, alkylnapthalenesulfonates, and cationic surfactants, such as, quartenary ammonium salts, polyoxyethylenated long chain amines, and quaternized polyoxyethylenated long chain amines.

35. The composition of Claim 34, wherein the organic acid is malonic acid in the amount of about 0.1 wt% and the corrosion inhibiting agent is benzotriazole in the amount of about 0.1 wt%.

36. A method of processing a wafer, the method comprising:

polishing the wafer with a slurry having a pH and an ionic strength;

after the wafer has been polished, applying a post-CMP wetting composition to the wafer, wherein the post-CMP wetting composition comprises:

a non-ionic surfactant having an HLB value in the range from 1 to 15, in an amount of between about .005-10% weight of the composition;

a complexing agent capable of complexing with trace metal impurities and Cu residue left by the slurry;

a corrosion inhibitor; and

a pH adjuster.

37. The method of claim 36, wherein the step of applying further comprises spraying the compositing on the wafer.

38. The method of claim 37, wherein the step of spraying further comprises loading the wafer into a load cup.

39. The method of claim 36, wherein the step of applying further comprises brushing the composition on the wafer.

40. A method of processing a wafer, the method comprising:

polishing the wafer with a slurry having a pH and an ionic strength;

after the wafer has been polished, applying a CMP wetting composition to the wafer, wherein the CMP wetting composition comprises:

a corrosion inhibiting agent; and

a pH adjuster,

wherein the composition has a pH that is ±1 pH unit of the pH of the slurry and an ionic strength of between about 10^{-2} and 10^{-5} mol/dm^3.

41. The method of claim 40, wherein the step of applying further comprises spraying the composition on the wafer.

42. The method of claim 41, wherein the step of spraying further comprises loading the wafer into a load cup.

43. The method of claim 42, wherein the step of applying further comprises brushing the composition on the wafer.